



**SEATTLE CITY LIGHT WORK ORDER #88-11
PCB TESTING AT DUWAMISH SUBSTATION AND A PRIVATE RESIDENCE**

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CREW-71

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July 28, 1988

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I. INTRODUCTION

On 16 June 1988, Raven Services Corporation undertook a project to determine the PCB presence and distribution under Capacitor Bank 823. This project was authorized by Seattle City Light Work Order #88-11. The capacitor bank of three racks is scheduled for removal in September 1988. The fill soil around and under the racks is the subject of this study. No historical evidence of spills or explosions of PCB fluid exist. The fill soil in the entire field is relatively new compared to the age of the racks, so little PCB contamination is expected. Seven concrete composites and seven soil composites were planned.

A separate task was assigned to this work order. The soil near a utility pole at the residence at 1300 E. Boston Street is suspected of contamination. A report of this study is in the Appendix.

II. SAMPLING METHODOLOGY

A. Container and Sampling Equipment

All samples were placed in 270 ml wide-mouth glass containers that had been pre-cleaned. The metal screw cap lids were lined with aluminum foil such that the dull side was in contact with the sample.

The pre-cleaning procedure involved scrubbing with a special petrochemical dissolving soap [HarborMaster Products, Inc., Edmonds, Washington]. The terminal end of the brush applied had sufficient bristles to scrub the seam where the side connects with the bottom. A final rinsing with methylene chloride was undertaken to remove any invisible greases and detergent residues.

Scoops and collection pans are laboratory grade stainless steel. Digging tools, augers and earth drilling bits are high carbon tool steel. Tools were cleaned with the aforementioned detergent and

rinsed with methylene chloride. The tools were buffed free of rust before arriving at the site.

B. Field Observations

Data on the collection process and observations of the physical nature of the sample were kept in the bound field log book. The format for this book is chronological.

C. Sampling Strategy

In accordance with EPA SW-846, sampling strategy was chosen from sections most analogous to the nature of the site. These sections are "waste piles" [1.4.3] and "landfills" [1.4.4]. Individual decisions were required for this site with the purpose of the study in mind. These include choosing sample sites and sampling intensity to provide information on any spills. Pre-sampling reconnaissance was undertaken by Roger Taylor of Seattle City Light and Mike Healy of Raven. No physical evidence of spills was observed.

D. Sample Collection

Method 8080 in the EPA SW-846 manual describes the protocol for handling of organochlorine pesticides and polychlorinated biphenyls. Compliance with these instructions necessitated using glass containers and specified conditions for refrigeration. All samples in our case were delivered to the laboratory in time to comply with the maximum seven days storage for extraction and thirty days for complete analysis.

Surface soil samples were collected with a trier to about 1 1/2" depth. Because of the compact rocky nature of the fill, the samples in the sumps were collected on a pre-cleaned 1 1/4" diameter auger bit after hand digging the rocky fill above. Compositing was undertaken in a 14" diameter round bottom stainless steel pan.

Concrete samples were collected by drilling with a 1" diameter percussion-rotary drill bit to a depth of 3/8". Three to four holes were drilled at random positions in each footing. The powders, brushed into an acrylic pan, constituted the individual sample.

All samples are listed in Table I. Their physical descriptions are given in Table II. Sample locations are presented in the Figures.

E. Analysis

Samples, stored no longer than five days at 40 C, were extracted with methylene chloride and taken up with pesticide grade hexane. Oily samples are pre-treated with an iso-octane sulfuric acid procedure to remove heavy petroleum residues that interfere with the PCB determination [cleanup modification of USEPA Method 3540 with the sonicator option]. The samples were analyzed by a modification of the packed column gas chromatography procedure described in Method 8080. Detection and confirmation of positive signals was accomplished with a Hewlett-Packard 5890 gas chromatograph using a HP-1 column. This column is a state-of-the-art commercial column evolved from those designated in Method 8080. Concentrations below 0.01 ppm are specified not detectable, which were grouped with samples below 1 ppm in Table I. QA/QC data and raw signal data are available upon request.

III. RESULTS AND DISCUSSION

The concrete footings were below one-half ppm. The highest soil sample result was the composite of six subsamples in the north field. The next highest was the south field composite. The next highest was the west interior composite of four subsamples. Potential concentrations are:

	<u>Concentration</u> [ppm]		<u>Potential Concentration</u> [ppm]
DD-10	1.76	X6	10.56
DD-9	1.49	X6	8.94
DD-12	1.30	X6	5.20

Since no physical evidence exists for a "hotspot," and since the Duwamish Substation is a non-public, protected industrial area, no further testing is recommended at this time.

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TABLE I
SAMPLE LISTINGS

<u>Sample #/ # Subsamples</u>	<u>Location</u>	<u>Concentration [ppm]*</u>
<u>CONCRETE:</u>		
DD-1 / 4	southwest	0.69
DD-2 / 4	south center	ND
DD-3 / 4	southeast	ND
DD-4 / 4	northeast	ND
DD-5 / 4	north center	ND
DD-6 / 4	northwest	0.53
<u>SOIL:</u>		
DD-7 / 4	west field	ND
DD-8 / 4	east field	ND
DD-9 / 6	south field	1.49
DD-10 / 6	north field	1.76
DD-11 / 6	both center fields	ND
DD-12 / 4	west interior	1.30
DD-13 / 4	center interior	0.92
DD-14 / 4	east interior	ND

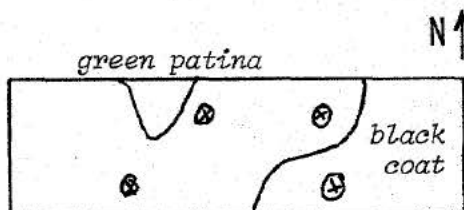
* all signals were identified as Aroclor 1242

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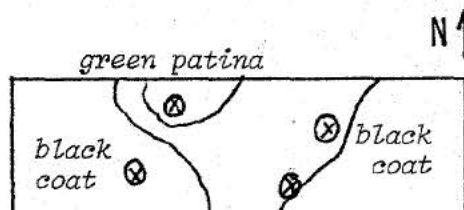
TABLE II
SAMPLE DESCRIPTIONS
CAPACITOR BANK 823

Concrete footings appear as follows:

DD-1
southwest



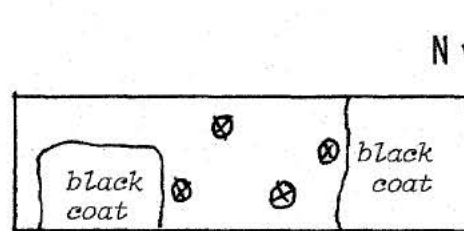
DD-2
south center



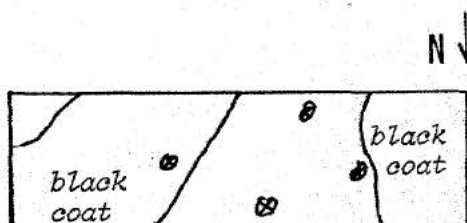
DD-3
southeast



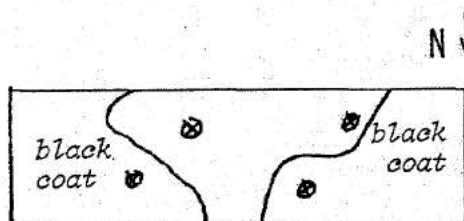
DD-4
northeast



DD-5
north center



DD-6
northwest



The soil samples, DD-7 through DD-14, all have the same description.
Lithography is as shown.

depth		
0"	0 0 0 0 0 0 0	pure cobbles or broken cobbles 1-2" diameter
	0 0 0 0 0 0 0	
	0 0 0 0 0 0 0	
	0 0 0 0 0 0 0	
	0 0 0 0 0 0 0	
6"	0 0 0 0 0 0 0	2-3" rocks
Sample depth range	00 o 000 o0 0	
	000 0 oo	
	0 o0 00	
	oo0 o o 000	
12"	0 oo 00 o o	brown sand, no clay
	ooo 000 o oo	
	..0.....0...	
	0.....	
0.....	
18"	
	...0.....	
0...	
	
	0.....	
24"0...	
	

June 20, 1988

Mr. Roger Taylor
Environmental Affairs Division
1015 Third Avenue
Seattle, Washington 98104



Subject: PCB Investigation, Poles at (b) (6) Residence

Dear Roger:

In response to your telecon on 14 June, I went to the site at 4:00 p.m. that day, contacting:

Mr. (b) (6)
1300 E. Boston
Seattle, WA
Phone: (b) (6) (home)
(b) (6)

Mr. (b) (6) seemed impressed with the rapidity of our response. He showed me the two wood utility poles in question, both located in the parking strip, north side of E. Boston Street.

The eastern-most pole is fairly old and has a transformer mounted on its eastern side. The base was surrounded by apparently healthy grass, sod depth approximately 3". I cut through the sod to reach mineral soil on both the east and west sides, taking a two-sample composite at 3" depth [Sample #BOS E-1]. Analysis showed a PCB level of 0.235 ppm. I also took a two-sample composite at 6" depth at this site [#BOS E-2] which was archived until the results of the analysis of the surface sample were reported.

The west pole is at the corner of E. Boston and 13th Avenue, a newer pole without any transformer. The area between the west side of the pole and the concrete curb was devoid of vegetation. An individual surface sample was taken from the center of the non-vegetated spot [BOS W-1] and another at 4" depth below that [BOS W-2] which was archived. The PCB value for sample #BOS W-1 proved to be 0.936 ppm. However, the analyst reported a high concentration broad peak of unknown constituents. The high value is indicated by the fact that he had to adjust the GC to Attenuation No. 8 to bring it on scale.

This broad peak might indicate some complex compound, such as creosote, which is made up of many constituents many of which would be close to each other under gas chromatography.

Raven Services Corporation

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SEA036804



Mr. Roger Taylor
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I had noticed that the west side of the western-most pole, the side immediately adjacent to the zone of no vegetation, had been coated from ground up to a level of approximately 2 feet with a black tar-like substance. This is the part of the pole most subject to splashing from street puddles by each vehicle making the turn from E. Boston onto 13th Avenue. Your later telecon to SCL Operations confirms that the tarry substance is undoubtedly creosote. One can surmise that leachate from the tarry surface causes the area of zero vegetation. Since the PCB values reported in the surface samples at both poles is low, we agree that there is little to be learned by analyzing the archived samples from depth.

Very truly yours,

A handwritten signature in dark ink, appearing to read "John Dermody", written over the typed name.

John Dermody
Technical Manager

JD/sc